MATERIAL SAFETY DATA SHEET

SRM Supplier: National Institute of Standards and Technology
Standard Reference Materials Group
100 Bureau Drive, Stop 2321
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SRM Number: 3071
MSDS Number: 3071
SRM Name: Glyphosate in Water
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SECTION I. MATERIAL IDENTIFICATION

Material Name: Glyphosate in Water

Description: A unit of SRM 3071 consists of five 2 mL ampoules, each containing approximately 1.2 mL of solution.

Other Designations: **Glyphosate** (n-phosphomethylglycine; n-phosphonomethylglcine; phosphonomethyliminoacetic acid; phosphonomethylglcine; glycine in **Water** (dihydrogen oxide)

Name	Chemical Formula	CAS Registry Number
Glyphosate	$C_3H_8NO_5P$	1071-83-6

DOT Classification: Non-hazardous under DOT regulations.

Manufacturer/Supplier: Available from a number of suppliers

SECTION II. HAZARDOUS INGREDIENTS

Hazardous Component	Nominal Concentration (%)	Exposure Limits and Toxicity Data
Glyphosate	0.0008	No occupational exposure limits established
		Man, Oral: LD_{LO}: 2 143 mg/kg
		Man, Oral: LD_{LO}: 1 214 mg/kg
		Woman, Oral: LD_{LO}: 4 g/kg
		Rat, Oral: LD_{50}: 4 873 mg/kg
		Rat, Inhalation: LC_{50}: >12 200 mg/m^3/4 hrs
		Mouse, Oral: LD_{50}: 1 568 mg/kg

SECTION III. PHYSICAL/CHEMICAL CHARACTERISTICS

Glyphosate	
Appearance and Odor: white solid with no odor	**Vapor Pressure (@ 20 °C):** negligible
Relative Molecular Mass: 169.07	**Evaporation Rate (ether = l):** not applicable
Density (water = 1): 1.74	**pH (1 % solution):** 2
Boiling Point: not applicable	**Water Solubility:** 1.2 %
Freezing Point: not applicable	**Solvent Solubility:** solubility not available; **insoluble** in organic solvents

SECTION IV. FIRE AND EXPLOSION HAZARD DATA

Flash Point: Not Applicable **Method Used:** Not Applicable **Autoignition Temperature:** Not Applicable

Flammability Limits in Air (Volume %): **UPPER:** Not Applicable
LOWER: Not Applicable

Unusual Fire and Explosion Hazards: Glyphosate is a slight fire hazard. Dust/air mixtures may ignite or explode. Glyphosate with steel reacts to form highly flammable and explosive hydrogen gas.

Extinguishing Media: Use regular dry chemical, carbon dioxide, water, or regular foam. Prevent pesticides residues from getting into the environment.

Special Fire Procedures: Fire fighters should wear a self-contained breathing apparatus (SCBA) with a full face piece in the pressure demand or positive mode and other protective clothing.

SECTION V. REACTIVITY DATA

Stability: **__X__ Stable** **_____ Unstable**

Conditions to Avoid: Avoid heat, flames, and sources of ignition. Avoid contact with the skin. **DO NOT** allow the material to contaminate water sources.

Incompatibility (Materials to Avoid): Glyphosate is incompatible with bases and metals.

See Section IV**:** *Unusual Fire and Explosion Hazards*

Hazardous Decomposition or By-products: Thermal decomposition of glyphosate may produce oxides of nitrogen, phosphorus, and carbon.

Hazardous Polymerization: **_____ Will Occur** **__X__ Will Not Occur**

SECTION VI. HEALTH HAZARD DATA

Route of Entry: **X** **Inhalation** **X** **Skin** **X** **Ingestion**

Glyphosate: Inhalation of glyphosate may cause irritation to the mucous membranes. Skin contact caused slight erythema in experimental animals. Repeated application produced moderate to severe erythema, edema, and necrosis. Eye contact caused slight irritation with corneal opacity and ulceration.

Ingestion of glyphosate produced cytoplasmic alteration and hypertrophy of salivary glands in experimental animals fed this pesticide. Prolonged or repeated ingestion has produced diarrhea, nasal discharge, inactivity, reduced body weight, stomach hemorrhages, and changes in the liver and kidneys.

Medical Conditions Generally Aggravated by Exposure: None reported

Listed as a Carcinogen/Potential Carcinogen:

	Yes	No
In the National Toxicology Program (NTP) Report on Carcinogens		X
In the International Agency for Research on Cancer (IARC) Monographs		X
By the Occupational Safety and Health Administration (OSHA)		X

EMERGENCY AND FIRST AID PROCEDURES:

Skin Contact: Remove contaminated shoes and clothing. Rinse affected area with large amounts of water followed by washing the area with soap and water. Watch for chemical irritations and treat them accordingly. Obtain medical assistance if necessary.

Eye Contact: Immediately flush eyes, including under the eyelids, with copious amounts of water for at least 15 minutes. Obtain medical assistance.

Inhalation: If inhaled, move the victim to fresh air. If breathing is difficult, give oxygen; if the victim is not breathing, give artificial respiration. Obtain medical assistance if necessary.

Ingestion: If ingested, wash out mouth with water. Obtain medical assistance immediately.

TARGET ORGAN(S) OF ATTACK: none reported

SECTION VII. PRECAUTIONS FOR SAFE HANDLING AND USE

Steps to be Taken in Case Material Is Released or Spilled: Notify safety personnel of major spills and/or leaks. Evacuate nonessential personnel. Stop the leak if one can do so without risk. Absorb small spills with sand or other absorbent material and place into containers for disposal. **DO NOT** flush into a sewer. Keep out of watersheds and waterways.

Waste Disposal: Follow all federal, state, and local laws governing disposal.

Handling and Storage: Persons handling this material must wear protective eyewear, clothing, and gloves to prevent contact with this material.

> **NOTE:** Contact lenses pose a special problem; soft lenses may absorb irritants and all lenses concentrate them. **DO NOT** wear contact lenses in the laboratory.

Sealed ampoules, as received, should be stored in the dark at a temperature lower than 30 °C.

SECTION VIII. SOURCE DATA/OTHER COMMENTS

Sources: MDL Information Systems, Inc., MSDS *Glyphosate*, 18 September 2001.
The Sigma Aldrich Library of Chemical Safety Data, Ed. II, 1988.

Disclaimer: Physical and chemical data contained in this MSDS are provided only for use in assessing the hazardous nature of the material. The MSDS was prepared carefully, using current references; however, NIST does not certify the data on the MSDS. The certified value for this material is given in the NIST Certificate of Analysis.